

ABSTRACT

A personal communication device comprises a housing, a receiver component, a processor and a multi-functional piezoelectric transducer. The transducer is mounted 5 within the housing, is electrically connected to the processor, and produces mechanical vibrations in response to the electrical signals transmitted by the processor. These mechanical vibrations are over a broad range of frequencies and are of a force sufficient to generate a tactile alert, an audible alert, and audible sound over the audible frequency range.

10 The transducer comprises a piezoelectric component and an acoustic member attached to one of the surfaces of the piezoelectric component. The piezoelectric component may comprise either an unimorph or a bimorph structure including a piezoceramic wafer made of lead zirconate titanate and a layer of dampening material sandwiched between the piezoelectric component and the acoustic member.

15 The acoustic member comprises a surrounding wall portion and an end portion which form an acoustic chamber when the member is mounted on a surface of the piezoelectric component. The end portion has an orifice to form a passageway from the chamber through the end portion to the outside of the member.